

CLAIMS

1. A method for manufacturing a device-incorporated substrate having an insulating layer, a conductor pattern
5 thereon, a void section formed therein, and an electric device housed in said void section and connected to said conductor pattern, said method comprising:

a void section forming step of forming a void section in said insulating layer;

10 a pattern forming step of forming said conductor pattern on a one surface of a transfer sheet made of metal;

a pattern transfer step of adhering said transfer sheet and said insulating layer each other with said conductor pattern therebetween, and removing said transfer sheet; and

15 a device housing step of housing said electric device within said void section, with said electric device connected to said formed conductor pattern;

and characterized in that removal of said transfer sheet includes a step of dissolving and removing at least a part of said
20 transfer sheet.

2. The method for manufacturing a device-incorporated substrate as described in claim 1, characterized in that:

said transfer sheet comprises a metallic base, and a
25 dissolvee metal layer that is layered so as to be separable with respect to said metal base material and onto which said conductor pattern is formed; and

removal of said transfer sheet includes a step of separating and removing said metal base material from said
30 dissolvee metal layer, and a step of dissolving and removing said dissolvee metal layer.

3. The method for manufacturing a device-incorporated substrate as described in claim 1, characterized in that:

5 said pattern forming step is done by an electroplating method.

4. The method for manufacturing a device-incorporated substrate as described in claim 1, characterized in that:

10 said pattern forming step includes a step of forming a conductor pattern on one surface of said transfer sheet, and a step of burying an insulating material in the gaps in said formed conductor pattern, and of flattening said one surface of said transfer sheet.

15 5. The method for manufacturing a device-incorporated substrate as described in claim 1, characterized in that:

 an adhesive material is applied onto one surface of said insulating layer in advance in said pattern transfer step.

20 6. The method for manufacturing a device-incorporated substrate as described in claim 1, characterized in that:

 said device housing step is done after adhering said transfer sheet and said insulating layer each other, but before removing said transfer sheet from said insulating layer.

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7. The method for manufacturing a device-incorporated substrate as described in claim 1, characterized in that:

30 said device housing step includes a step of housing said electric device in said void section and connecting said conductor pattern, and a step of injecting a seal resin into a space between said electric device and said conductor pattern.

8. The method for manufacturing a device-incorporated substrate as described in claim 2, characterized in that:

5 said dissolvee metal layer and said conductor pattern are made of different metal material, and said step of dissolving and removing said dissolvee metal layer is done by using an etchant which is able to dissolve said dissolvee metal layer but is unable to dissolve said conductor pattern.

10 9. The method for manufacturing a device-incorporated substrate as described in claim 1, characterized in that:

15 said void section forming step includes a step of forming a through hole together with said void section, for connecting both surfaces of said insulating layer, and a step of filling conductive material into said through hole.

10. The method for manufacturing a device-incorporated substrate as described in claim 9, said method characterized by further comprising:

20 layering said formed device-incorporated substrates multiply with electric connection at said through hole, after said step of filling conductive material.

25 11. A device-incorporated substrate having an insulating layer, a conductor pattern thereon, a void section formed therein, and an electric device housed in said void section and connected to said conductor pattern, characterized in that:

said conductor pattern comprises an electroplated layer adhered to an upper surface of said insulating layer.

12. The device-incorporated substrate as described in claim 11, characterized in that:

5 said conductor pattern is a transferred layer of a patterned electroplated film deposited on a transfer sheet made of metal.

13. The device-incorporated substrate as described in claim 11, characterized in that:

10 an insulating material is buried in the gaps in said formed conductor pattern, and an upper surface of said insulating layer is flattened.

14. The device-incorporated substrate as described in claim 13, characterized in that:

15 said insulating material is a plating resist.

15. The device-incorporated substrate as described in claim 11, characterized in that:

20 an underfill resin layer is formed between said electric device and said conductor pattern.

16. The device-incorporated substrate as described in claim 11, characterized in that:

25 a plurality of insulating layers having said conductor pattern formed thereon are layered each other.

17. A method for manufacturing a printed circuit board, said method comprising:

30 a pattern forming step of forming a conductor pattern on a one surface of a transfer sheet;

a pattern transfer step of adhering said transfer sheet to said insulating layer with said conductor pattern therebetween, and removing said transfer sheet; characterized in that:

5 said transfer sheet is made of metal, and removal of said transfer sheet includes a step of dissolving and removing at least a part of said transfer sheet.

18. The method for manufacturing a printed circuit board as described in claim 17, characterized in that:

10 said transfer sheet comprises a metallic base, and a dissolvee metal layer that is layered so as to be separable with respect to said metal base material and onto which said conductor pattern is formed; and

15 removal of said transfer sheet includes a step of separating and removing said metal base material from said dissolvee metal layer, and a step of dissolving and removing said dissolvee metal layer.

19. The method for manufacturing a printed circuit board as described in claim 17, characterized in that:

20 said pattern forming step is done by an electroplating method.

20. The method for manufacturing a printed circuit board as described in claim 17, characterized in that:

25 an adhesive material is applied onto one surface of said insulating layer in advance in said pattern transfer step.

21. The method for manufacturing a printed circuit board as described in claim 18, characterized in that:

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said dissolvee metal layer and said conductor pattern are made of different metal material, and said step of dissolving and removing said dissolvee metal layer is done by using an etchant which is able to dissolve said dissolvee metal layer but is unable
5 to dissolve said conductor pattern.

22. A printed circuit board having an insulating layer and a conductor pattern formed thereon, characterized in that:

said conductor pattern comprises an electroplated layer
10 adhered to an upper surface of said insulating layer.

23. The printed circuit board as described in claim 22, characterized in that:

said conductor pattern is a transferred layer of a
15 patterned electroplated film deposited on a transfer sheet made of metal.